PART 1
PROJECT DESCRIPTION

Use for all categories. Projects are judged based on criteria of sustainable design, architectural merit and innovation. **Please submit Part 1 and Part 2 as separate pdf files.**

2026 CANADIAN GREEN BUILDING AWARDS

THE NATIONAL PROGRAM OF SUSTAINABLE ARCHITECTURE & BUILDING MAGAZINE SABMag

PROJECT CATEGORIES

Identify which Award category you are entering

☐ **1. Residential [small]**
Open to new or renovated buildings less than 600m² in area, of which a minimum of 75% is dedicated to single-family or multi-family residential uses.

☐ **2. Residential [large]**
Open to new or renovated buildings [typically multi-unit buildings or groups of related buildings] greater than 600m² in area, of which at least 75% is dedicated to residential uses.

☐ **3. Commercial/Industrial [small]**
Open to new or renovated buildings up to 2,000m² in area, of which more than 75% is dedicated to commercial or industrial uses.

☐ **4. Commercial/industrial [large]**
Open to new or renovated buildings [or groups of related buildings] greater than 2,000m² in area, of which at least 75% of the floor area is dedicated to commercial or industrial uses.

☐ **5. Institutional [small]**
Open to new or renovated buildings up to 2,000m² in area, of which more than 75% is dedicated to institutional uses.

☐ **6. Institutional [large]**
Open to new or renovated buildings [or groups of buildings] greater than 2,000m² in area, of which at least 75% of the floor area is dedicated to institutional uses.

■ **7. Mixed Use**
Open to new or renovated buildings [or groups of related buildings] of any size, in which no individual use exceeds 75% of the overall floor area.

☐ **8. Existing Building Upgrade**
Open to buildings of any size or type in which the primary focus of the work has been to enhance the performance or extend the life of an existing structure. Entries in this category are required to respond only to the submission criteria appropriate to the project.

☐ **9. Interior Design**
Open to interior design projects of any size or type. Entries in this category are required to respond only to the submission criteria appropriate to the project.

An award will be given in each category at the discretion of the jury.

PROJECT DETAILS

Project name: Koffler Scientific Reserve Dining and Operations Centre
Address: 17000 Dufferin St, King City, ON L7B 1K5
Year completed: 2025

PROGRAM AND CONTEXT

Project type: [Identify all uses occupying 10% or more of gross floor area]
Mixed-use: dining, student housing, teaching, operations support

Project site: [Check all that apply]

☐ Previously undeveloped land ☐ Urban ■ Rural

☒ Previously developed land ☐ Suburban

Other Building description: [Check only one]

■ New ☐ Renovation ☐ Both [If both, list __% new and __% renovation]

METRICS* Provide the following information as applicable to your project.

- Site Area: 3.5e+6 m²
- Building gross floor area: 2,681.18 m²

Energy Use Intensity (EUI)

This key metric measures the total energy consumption of a building per unit of gross floor area per year. This figure includes heating, cooling, lighting and operating equipment such as computers and elevators. For industrial and commercial buildings with specific processing equipment, identify this separately from the basic EUI figure.

- Building EUI = 50.7 kWh/m²/year
- Process EUI (if appropriate) = NA kWh/m²/year
- Reduction in EUI relative to reference building = 45 % please specify the standard used (ASHRAE/MNECB or other)
- State reference standard: SB-10 Baseline

- Recycled materials content: NA % by value
- Construction materials diverted from landfill: 82 %
- Regional materials by value: NA
- Water consumption from municipal source: 0 litres/occupant/year

[Include both base building and process consumption]

- Reduction in water consumption: 50 %
- State the reference on which the % reduction is based: ■ LEED or other ☐

*NOTE FOR PART 9 RESIDENTIAL PROJECTS: PROVIDE THE STATISTICS ABOVE IF AVAILABLE. Include in the Executive Summary [see next page] the EnerGuide or the Home Energy Rating System [HERS] ratings if available, and the WalkScore rating [see www.walkscore.com]. Also, a qualitative assessment of project performance should be included in the appropriate sections of the narrative.

Located in King Township on the Oak Ridges Moraine, the University of Toronto Koffler Scientific Reserve (KSR) is one of Canada's premier destinations for field research and education in biodiversity, ecology, and conservation biology. The new, purpose-built Dining and Operations Centre brings much-needed student housing and multi-purpose teaching space to the site while reinforcing the Reserve's core commitments to conservation and ecological stewardship.

The building plan recalls a traditional collegiate model with five four person dorms, common room, bathing facilities, classrooms, hall and refectory arranged around three sides of a quad. Its form reimagines local agrarian architecture through asymmetrical pitched roofs and elongated façades punctuated by slender vertical windows.

Safeguarding the Moraine's sensitive ecosystem was the project's primary design constraint. In response, the building adopts a first principles approach to sustainability, guided by four strategies:

» **Build lightly on the land**
» **Pair poetry with performance**
» **Let passive design lead**
» **Use only what is essential**

Together, these strategies inform the overall intent: **to design a building that does as little harm as possible - one that draws only what it needs from the land, returns what it can, and avoids creating new or lasting human impact.** The project is designed to achieve net zero carbon, net zero energy performance and LEED Gold certification.

KOFFLER SCIENTIFIC RESERVE DINING AND OPERATIONS CENTRE

1

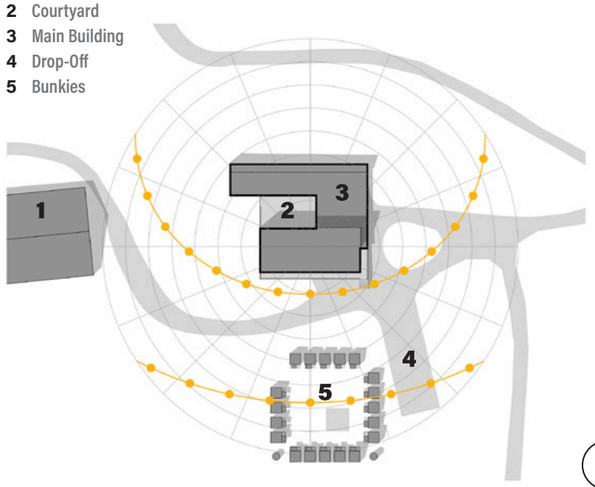
STRATEGIC DECISIONS

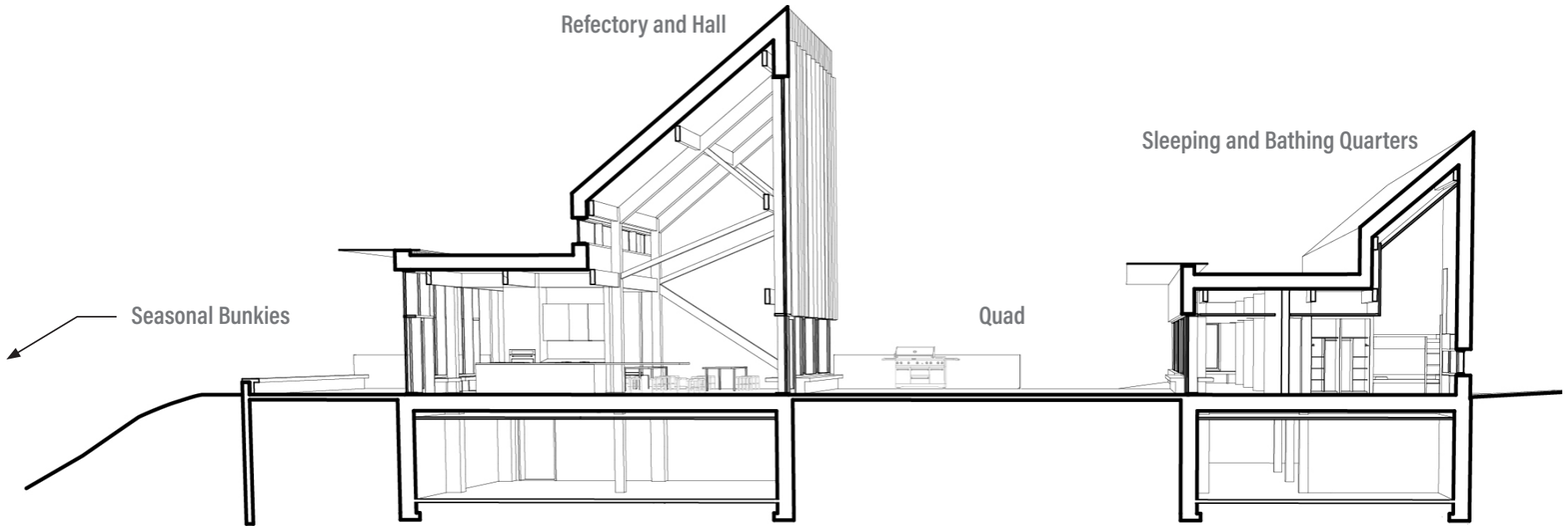
Design decisions for the Dining and Operations Centre were fundamentally shaped by the imperative to preserve the ecological integrity of the Oak Ridges Moraine. The building is deliberately confined to the footprint of three decommissioned barns, concentrating development within an already disturbed area. This area directly informed the size and shape of its footprint. In the absence of a built context, the building is oriented due south. True to its contemporary reinterpretation of traditional agrarian architecture, the design leverages age-old building science rooted in the movement of light and air to achieve its sustainable goals.

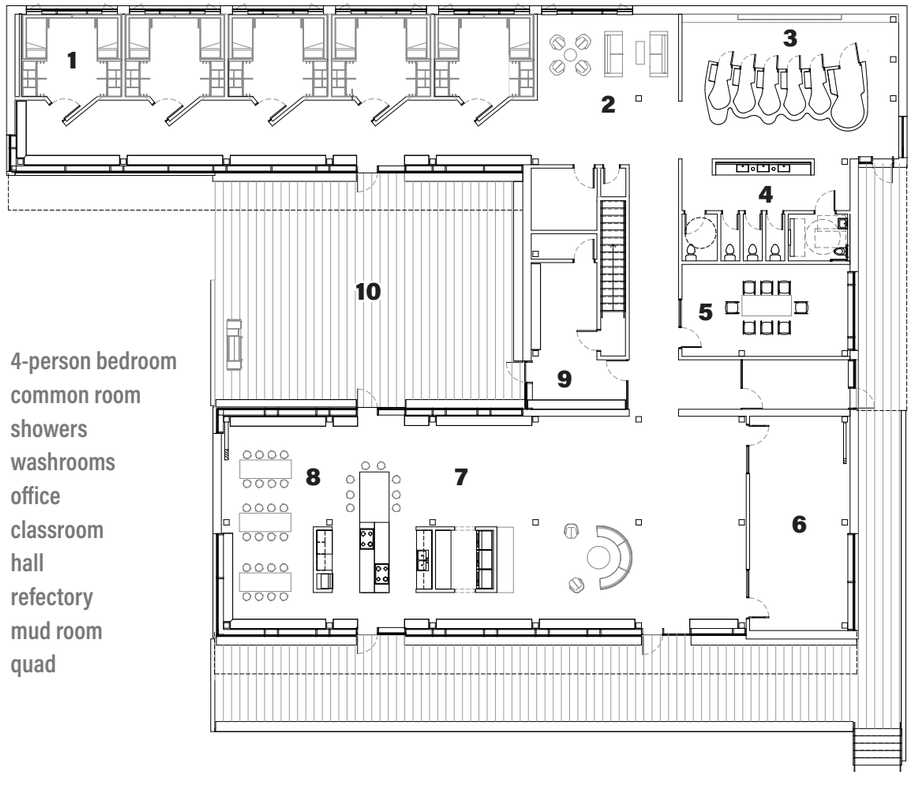
Each façade is carefully calibrated to respond to the solar path while the building's narrow section and sloping ceilings promote passive and stack effect ventilation, earth tubes pre-condition incoming air and thermal mass helps regulate indoor conditions. Passive strategies are paired with active systems – automated windows, ERVs, and a geothermal loop – to create a responsive building envelope that, much like breathable activewear, opens and closes in response to site specific weather conditions while minimizing energy use. Moreover, resulting roof geometries provide optimal surfaces for photovoltaic panels. Variations in scale between the north and south volumes reinforce programmatic intent, distinguishing private sleeping quarters from larger communal spaces and community life.

SITE PLAN

1 Existing Two-Storey Barn
2 Courtyard
3 Main Building
4 Drop-Off
5 Bunkies

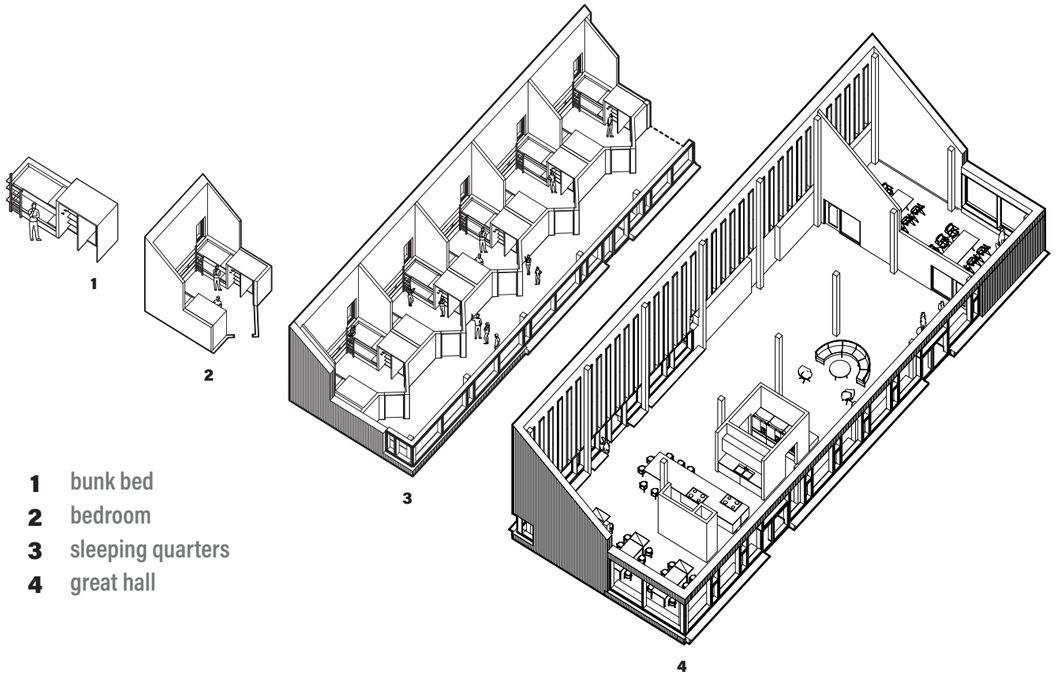






1 4-person bedroom
2 common room
3 showers
4 washrooms
5 office
6 classroom
7 hall
8 refectory
9 mud room
10 quad

from the individual ◄ ····· ► *to the collective*



1 bunk bed
2 bedroom
3 sleeping quarters
4 great hall

2

COMMUNITY

This project does not support the public realm as a city building project would. True to the University's programming, it minimizes its architectural footprint in service of ecological integrity and enhancement.

3

SITE ECOLOGY

The primary objective of the site design was to safeguard the ecologically sensitive landscape from further human impact in alignment with the Lake Simcoe Conservation Authority, which oversees the Moraine. As noted, the building is deliberately confined to the footprint of three former barns, preserving existing habitats and maintaining the site's natural topography. Beyond the building footprint, significant care was taken to minimize site disturbance and eliminate impervious surfaces wherever possible. All required vehicular routes are constructed using compacted gravel, reducing surface runoff and allowing for natural infiltration. A series of swales surrounding the building perimeter were incorporated to manage stormwater on site, mitigating erosion and protecting surrounding ecosystems from construction related impacts. Areas temporarily disturbed to accommodate construction were restored using native seed mixes, supporting the reestablishment of local vegetation.

4

LIGHT AND AIR

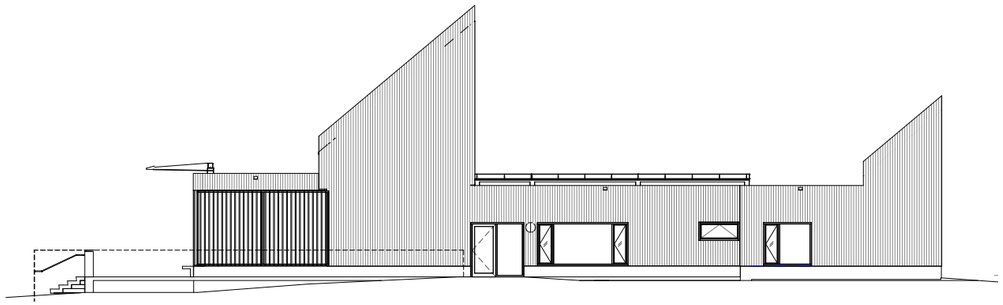
Elongated façades with generous vertical glazing and large perimeter windows draw daylight deep into occupied spaces. More than 90% of the occupied floor area is within 7 metres of an operable window. External shading devices and deep roof overhangs are carefully calibrated to admit low-angle winter sun while mitigating summer heat gain. This daylighting strategy is complemented by an efficient electric lighting system with advanced controls, including daylight-responsive dimming and occupancy sensing. Together, these measures achieve low lighting power densities and a projected **annual lighting energy consumption of 6.3 kWh/m²/year.**

Steeply sloped ceilings collect warm air as it rises, while automated operable windows release it as needed to support stack-driven ventilation. Window automation is integrated into the building automation system and informed by a dedicated on-site weather station located on the roof. By relying on real-time, site-specific climate data rather than regional forecasts or thermostat-based controls the system maximizes opportunities for passive ventilation. Natural ventilation is further enhanced through earth tubes, which pre-condition outdoor air underground before it enters the building, extending the natural ventilation season, reducing heating and cooling loads, and mitigating exterior noise.

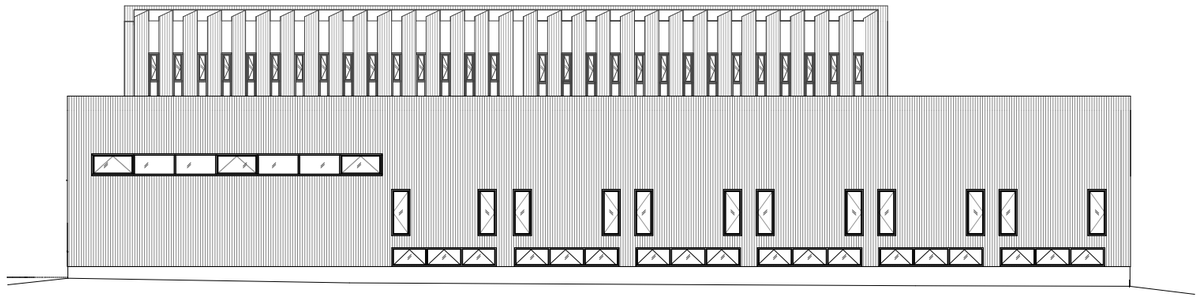
5

WELLNESS

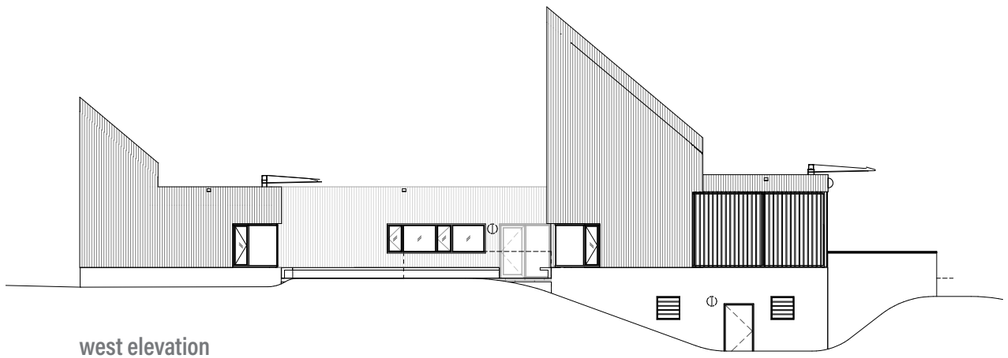
Designed for people who love to be outdoors and spend their days working in the field, the building supports occupant health through connection - to the land and to one another. The exposed timber structure, large windows with uninterrupted views of the site, generous overhangs, and a continuous bench wrapping both the interior and exterior blur the boundary between indoors and outdoors, reinforcing a deep and revitalizing relationship with the landscape. Shared dining, living, and circulation spaces are intentionally conceived as catalysts for human connection, fostering conviviality and reinforcing the collective experience of fieldwork. This emphasis on shared life strengthens both individual wellbeing and the social fabric of the Reserve.



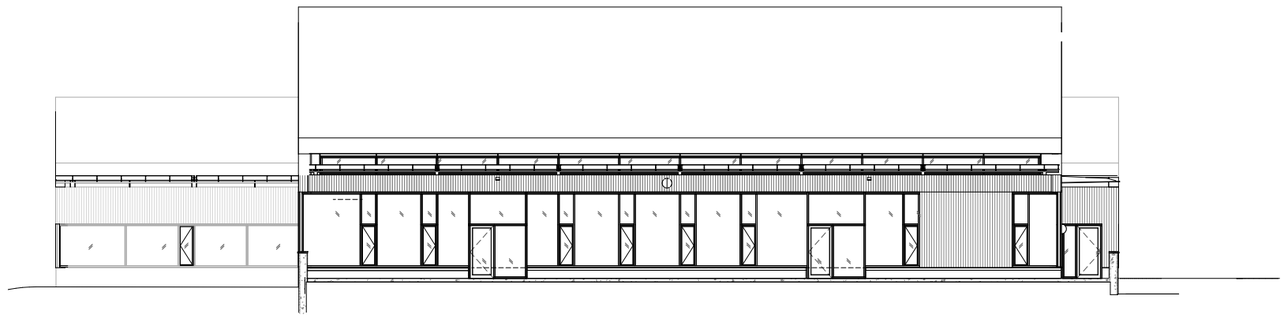
east elevation



north elevation



west elevation



south elevation

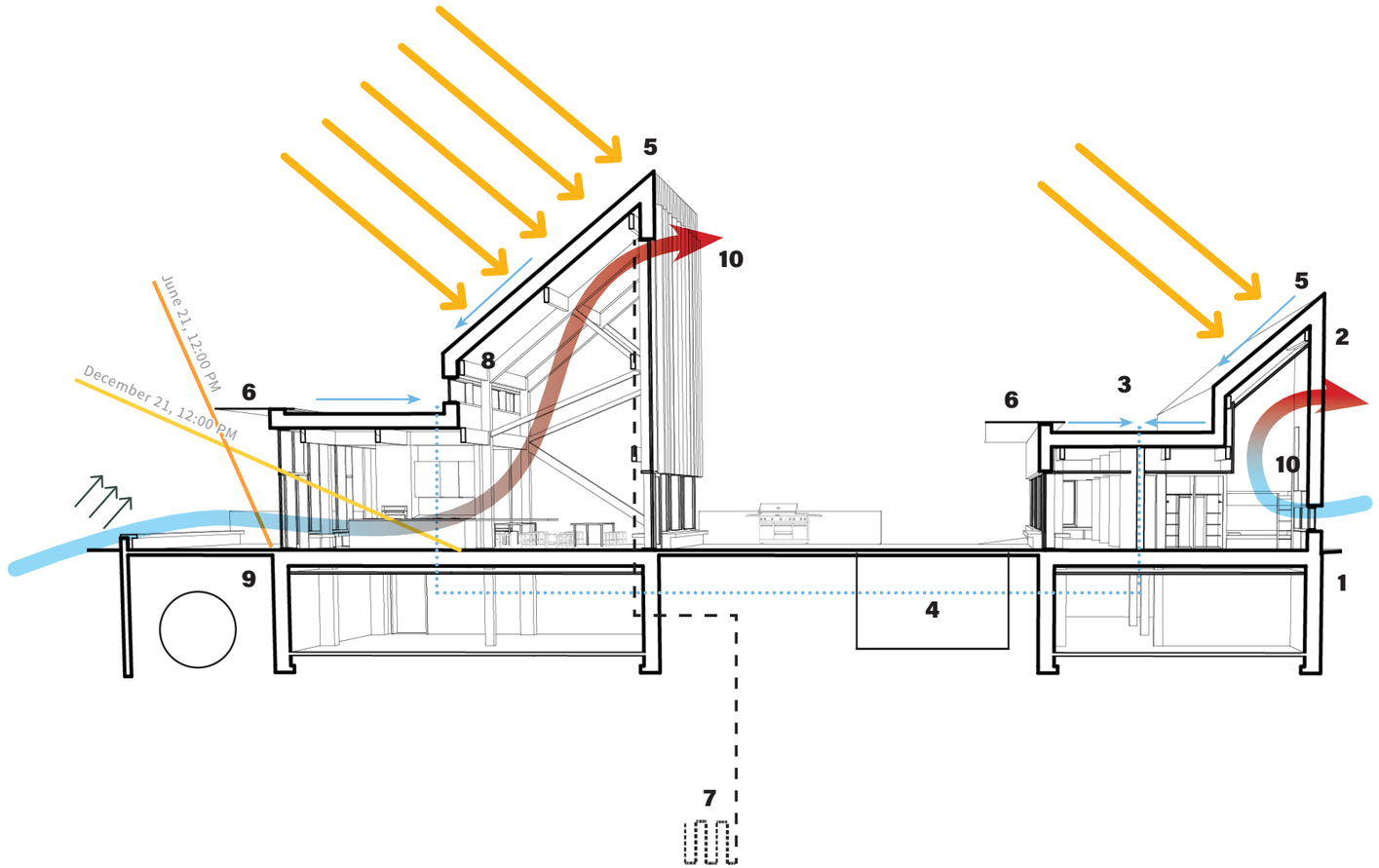
6

WATER CONSERVATION

The building employs a net-zero water strategy in which all water is sourced on site through a well, treated on site, and returned to the ground through an on-site leeching bed system, eliminating reliance on municipal or other centralized off-site supplies. As a result, the project achieves a projected potable water consumption of zero liters per m^2/occupant/annum for the building from municipal or other centralized off-site supply.

ENERGY REDUCTION THROUGH PASSIVE STRATEGIES

1. Insulated Nexem Form
2. Structural insulated panels
3. Storm water from roof
4. Storm water cistern
5. Photovoltaic panels for renewable energy, solar thermal for hot water pre-heat
6. Sun shades to maximize winter sun penetration and minimize summer sun penetration
7. Geothermal Heat Exchange
8. High level and clerestorey windows for daylighting
9. Earth Tube
10. Cross ventilation with low inlet and high outlet for stack effect

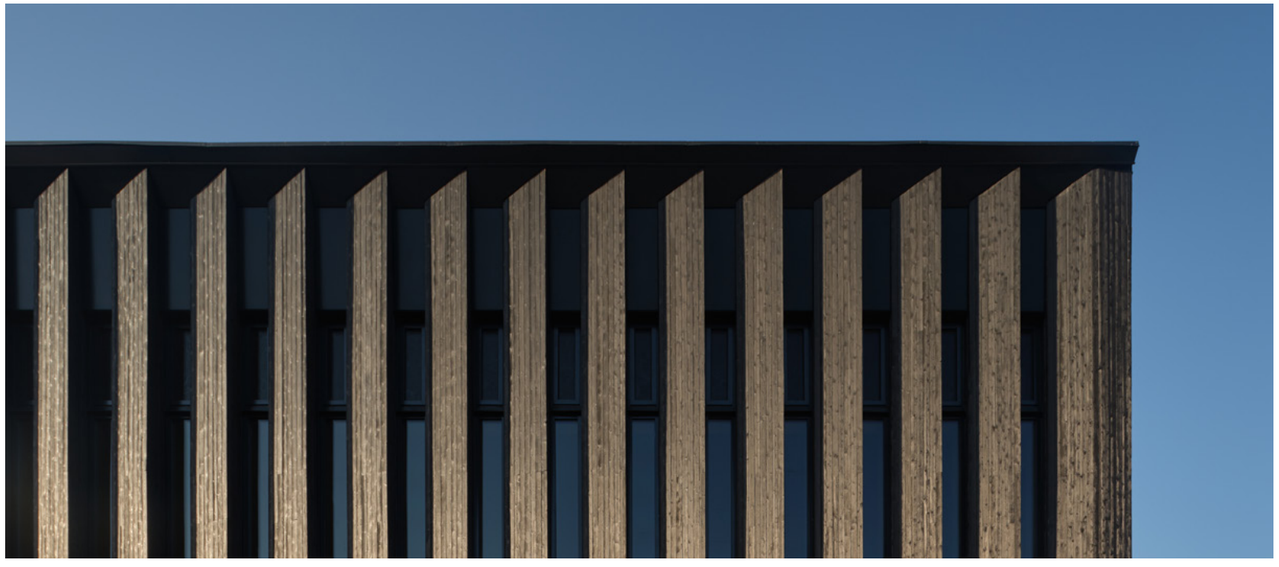


7

OPERATING ENERGY PRESENT AND FUTURE

The building's active systems are intentionally designed to optimize and extend its passive performance. Radiant in floor heating is embedded within the ground floor thermal mass, enabling efficient heat storage and release while enhancing occupant comfort. Fresh air is supplied through high efficiency energy recovery ventilators (ERVs) operating at up to 85% efficiency and directly connected to earth tubes, allowing full dedicated outdoor air to be tempered even in fan only mode. This configuration extends passive ventilation seasons and significantly reduces heating and cooling loads. When active conditioning is required, a ground source heat pump with an EER of 18.4 works in concert with the earth tubes and radiant floors to provide low carbon heating and cooling. The building transitions seamlessly between passive and active modes using real time data from an on site weather station integrated into the building automation system. Sharply angled, south facing rooflines support a photovoltaic array that generates 100% of the building's annual electricity demand, with surplus energy exported to the municipal grid. Together, these integrated strategies result in an overall EUI of **50.7 kWh/m²/year,** with a **Heating TEDI of 17.5 kWh/m²/year** and a Cooling **TEDI of 20.0 kWh/m²/year.**

Of note, KSR maintains a steady year-round cohort of researchers but experiences peak demand during spring and summer, addressed through a flexible occupancy strategy using nearby seasonal bunkies. These minimal structures rely on shared facilities in the main building and can be fully shut down during off peak periods, reducing energy use and maintenance during quieter months.



MATERIALS AND RESOURCES

The structural system combines glulam columns and beams with conventional lightweight framing and tongue-and-groove decking, which also serves as the finished ceiling. Mass timber trusses in the great hall create an open, vaulted space that supports both roof geometry and the building's natural ventilation strategy, reinforcing the alignment between architectural intent and performance.

Foundations and basement walls use a cellulose-based insulated concrete form (ICF) alternative that significantly reduces embodied carbon compared to conventional foam ICFs while maintaining equivalent thermal and structural performance. This system allows for mineral wool insulation in lieu of foam and functions as both the interior and exterior basement wall finish, eliminating additional interior assemblies. The result is continuous thermal resistance across all below-grade elements and a clean interface with the above-grade envelope.

Twelve-inch structural insulated panels (SIPs) are used for both walls and roof, creating a continuous, highly insulated enclosure with R-40 wall and R-60 roof assemblies. The SIPs act as both structure and vapor control layer, with taped joints ensuring airtightness and envelope performance.

The building is clad in Shou Sugi Ban charred cedar, selected for durability and its connection to the site's agrarian history. Installed as a ventilated rainscreen, it enhances drainage and drying while eliminating the need for chemical sealants.

Glazing consists of triple-pane, aluminum-clad wood windows and curtain wall systems to improve thermal performance while maintaining interior material continuity. Interior finishes are intentionally minimal – exposed wood, gypsum board, and plywood veneer – chosen for durability, low embodied carbon, and long-term resilience.

No life-cycle analysis was conducted.

9

BUILDING LIFE CYCLE CONSIDERATIONS

While full post construction testing data is still pending, lifecycle principles were applied throughout the design process. Wood construction paired with a cellulose based insulated concrete form foundation establishes a low carbon structural system, significantly reducing embodied carbon compared to conventional assemblies. Material selection prioritized regenerative, low toxicity solutions, including mass timber structure, wood cladding, and exposed interior finishes. In parallel, the building is designed to operate without greenhouse gas emissions or non renewable fuels, further reducing whole life carbon impacts. 84% of waste was recycled during construction.

10

EDUCATION AND INFORMATION SHARING

With 350 hectares of wetlands and forests, KSR is a true living laboratory – an immersive environment for teaching, learning, and discovery. This project demonstrates how the right building, serving the right purpose, can exist within a sensitive ecological landscape while actively supporting local conservation efforts. It reinforces the University's longstanding commitment to stewardship of the site and advances KSR's mission of fostering sustainability through learning in and about the environment by embedding sustainable strategies into the daily experience of researchers and students.